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(54) TACKY ADHESIVE COMPOSITION AND TACKY ADHESIVE TAPE

(57)Abstract:

PURPOSE: To obtain the subject composition composed of a thermoplastic block copolymer and a specific tackifier resin, free from ill odor, having excellent high-temperature characteristics and suitable for the packaging of food, etc.

CONSTITUTION: This tacky adhesive composition is composed of (A) a thermoplastic block copolymer such as styrene-isoprene-styrene block copolymer and (B) a tackifier resin consisting of a copolymer of a vinyl-substituted aromatic hydrocarbon such as styrene and a ring-forming 8-10C unsaturated alicyclic hydrocarbon or a mixture of homopolymers of the above monomers. This tacky adhesive tape is produced from a tacky adhesive layer composed of the tacky adhesive composition and a tape substrate.

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MEANS

[Means for Solving the Problem] this invention is characterized by a vinyl substitution aromatic hydrocarbon and the carbon atomic number which constitutes a ring using the mixture of a copolymer with the unsaturation alicycle group hydrocarbon of 8-10, or each homopolymer as a tackifier in the binder constituent which consists of a thermoplastic block copolymer and a tackifier.

[0006] this invention is explained in detail below. As a thermoplastic block copolymer used by this invention, a styrene-isoprene-styrene block copolymer (it omits Following SIS), a styrene-butadiene-styrene block copolymer (it omits Following SBS), a styrene-ethylene-butadiene-styrene block copolymer (it omits Following SEBS), etc. are mentioned.

[0007] Although a tackifier gives adhesiveness to the above-mentioned thermoplastic block copolymer, in this invention, the mixture of the copolymer of a vinyl substitution aromatic hydrocarbon and the unsaturation alicycle group hydrocarbon of carbon numbers 8-10 or each homopolymer is used. The vinyl substitution aromatic hydrocarbon said here makes a ring the main frame, and points out what has the unsaturation machine of ethylene nature as a substituent in this. For example, styrene, an alpha methyl styrene, and vinyltoluene can be mentioned. Moreover, the carbon atomic number of the unsaturation alicycle group hydrocarbon of 8-10 which constitutes a ring is the hydrocarbon compound of a monocycle or a polycyclic formula, and the carbon atomic number which constitutes a ring points out at least the singular number or the thing which it has for a double bond endocyclic by 8-10. For example, an indene and a dicyclopentadiene are mentioned. It joins together by each unsaturated bond, and a vinyl substitution aromatic hydrocarbon and the unsaturation alicycle group hydrocarbon of carbon numbers 8-10 serve as duality or a 3 yuan or more copolymer. By choosing at least one sort of monomers at a time from two groups of the above-mentioned vinyl substitution aromatic hydrocarbon and an unsaturation alicycle group hydrocarbon, the mixture of the homopolymer of not only the plural polymers that make total monomer composition a component but a monomer, or the mixture of the copolymer of partial composition can be used similarly [the mixed constituent which is fully mixed and is obtained].

[0008] The carbon atomic number which constitutes an above-mentioned vinyl substitution aromatic hydrocarbon and an above-mentioned ring from this invention as a tackifier can also use together and use an aliphatic system hydrocarbon resin, an alicycle group system hydrocarbon resin, etc. which are used conventionally with the copolymer or mixture with an unsaturation alicycle group hydrocarbon of 8-10. In addition, you may add a softener and an antioxidant and other additives, such as naphthene oil, if needed.

[0009] A hot-melt type binder constituent is obtained by blending a tackifier and other additives with a thermoplastic block copolymer, and carrying out melting mixture at an elevated temperature. An adhesive tape can be manufactured by applying to tape base materials, such as paper and a film, with a coat, a curtain flow coat, etc. by extruding at an elevated temperature according to a conventional method using this constituent.

OPERATION

[Function] In order that the carbon atomic number which constitutes an above-mentioned vinyl substitution aromatic hydrocarbon and an above-mentioned ring from this invention as a tackifier may use the copolymer or mixture with an unsaturation alicycle group hydrocarbon of 8-10, the well-balanced adhesion physical properties which were excellent in compatibility with a thermoplastic block copolymer, and were excellent in the elevated-temperature property are given. And the coumarone which decomposes and becomes the stinking one origin is not included.

[0011]

EXAMPLE

[Example] The following examples explain this invention in detail.

1. Copolymerization was carried out [as examples 1, 2, and 3 and a 4 vinyl substitution aromatic hydrocarbon] using the catalyst at a rate which shows an indene and a dicyclopentadiene in Table 1 by the weight ratio as styrene, vinyltoluene, and an unsaturation alicycle group hydrocarbon of carbon numbers 8-10, and four sorts of resins of resins 1-4 were obtained. In the conventional method, molecular weight and softening temperature were measured per [which was obtained] resin. A result is shown in Table 1.

[0013] As the aliphatic system adhesion resin which uses together the 100 sections and the above-mentioned resins 1-4 for TR-1107 by Shell Chemistry company the 25 sections as a SIS system block copolymer. The Queen ton A-100 by Nippon Zeon [Co., Ltd.] Co., Ltd. was supplied to the mixer which blended IRUGA NOx 1010 made from Ciba-Geigy for shelf Rex 371 by Shell Chemistry company as the 100 sections and naphthene oil for softeners, blended the one section as the 50 sections and an antioxidant, and was kept at 180 degrees C, and carried out melting mixture under nitrogen atmosphere, and the hot-melt type binder was obtained. It applied to the kraft paper for adhesive tapes with a thickness of 120 microns which extruded the obtained binder and performed mold release processing to the rear face on the coat so that **** might become 40 microns, and the adhesive tape was obtained.

[0014] **** was measured in the conventional method about the obtained tape. Moreover, based on JIS-Z -0237, SP adhesion, a tuck, and SP holding power were measured. About the odor, it asked for the evaluation which to have evaluated O and the practically usable thing by **, and I had evaluate an unusable thing by organoleptics in three stages of x, and corresponded the satisfactory thing about the grade of an odor at ten testers supposing the food packing use. A result is shown in Table 2.

[0015] 2. In example of comparison 1 examples 1-4, as coumarone-indene resin, the id cron V-120 by the NIPPON STEEL Chemistry company was blended, and others were similarly made as an experiment and evaluated instead of resins 1-4. A result is shown in Table 2.

[0017] It turns out that tape physical properties are equal to that for which the thing using resins 1-4 used coumarone-indene resin from Table 2, and there are no restrictions on an odor.

[0018] 3. As example 5 and 6 SIS system block copolymerization It is about TR-1107 by Shell Chemistry company considering the 100 sections and the above-mentioned resin 2 as the five sections or an aliphatic system adhesion resin used together the 50 sections. The Queen ton A-100 by Nippon Zeon [Co., Ltd.] Co., Ltd. was supplied to the mixer which blended shelf Rex 371 by Shell Chemistry company as the 100 sections and naphthene oil for softeners, blended

the 1 section of IRUGA NOx 1010 made from Ciba-Geigy as the 50 sections and an antioxidant, and was kept at 180 degrees C, and carried out melting mixture under nitrogen atmosphere, and the hot-melt type binder was obtained. It built a prototype and evaluated like examples 1-4 below. A result is shown in Table 3.

[0019] 4. In the example 2 of comparison, and three examples 5-6, as coumarone-indene resin, it blended, as shown in Table 3, and similarly, others were made as an experiment and evaluated the id cron V-120 by the NIPPON STEEL Chemistry company instead of the resin 2. A result is shown in Table 3.

[0020]

[0021] 5. In the example 2, TR-1102 by Shell Chemistry company were used for the 7th example as an SBS system block copolymer instead of the SIS system block copolymer, and it built a prototype and evaluated similarly. A result is shown in Table 4.

[0022] 6. In example of comparison 4 example 2, as coumarone-indene resin, the id cron V-120 by the NIPPON STEEL Chemistry company was blended, and others were similarly made as an experiment and evaluated instead of the resin 2. A result is shown in Table 4.

[0023]

[0024] 7. In examples 8 and 9 and ten examples 2, the thickness of a binder layer was applied to the kraft paper for adhesive tapes with a thickness of 120 microns, and was similarly evaluated so that it might become abbreviation 20 and 50 or 80 microns. A result is shown in Table 5.

[0025] 8. In the examples 5 and 6 of comparison, and the example 1 of 7 comparison, the thickness of a binder layer was applied to the kraft paper for adhesive tapes with a thickness of 120 microns so that it might become abbreviation 20 and 50 or 80 microns, and it was evaluated similarly. A result is shown in Table 5.

[0026]

[0027] 9. In an example 11 and 12 examples 2, the binder was applied and estimated that **** becomes 30 or 60 microns on the Vinylon sheet which laminated the polyethylene resin on the Vinylon [by the Noto textiles company] original cloth which becomes with the thread composition which shows a tape base material to the OPP film of 60-micron ** which carried out mold release processing, or the following, and performed mold release processing to it. Vinylon original cloth 64 warp/inch (100 deniers, 25 filaments)

The 42 weft/inch (70 deniers, 25 filaments)

A result is shown in Table 6.

[0028] 10. Like examples 11 or 12, a prototype was built and combination of the example 9 of comparison and the example 1 of 10 comparison estimated. A result is shown in Table 6.

[0029]